# MARINE
# RECREATIONAL INFORMATION
# PROGRAM

**FY  Project Plan**

**Finalize Design of MRIP Fishing Effort Surveys**

**Created on**

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# 1. Overview

## 1.1. Background

In response to recommendations provided by the National Research Council (NRC), as well as mandates included in the Magnuson-Steven's Reauthorization Act (MSRA), MRIP is developing fishing effort surveys that sample from databases of licensed or registered saltwater anglers. To date, these efforts have focused on designing dual-frame surveys that integrate angler license frames with residential address frames (address-based sampling or ABS). Specifically, MRIP has completed two pilot studies to test the feasibility of dual-frame mail survey designs and has recently implemented a third pilot study to test a dual-frame, mixed-mode design that includes both mail and telephone data collection.

Without exception, the inclusion of address-based sampling in the dual-frame approach provides greater coverage than the Coastal Household Telephone Survey (CHTS) or single-frame surveys that sample exclusively from databases of licensed anglers. Furthermore, dual-frame mail surveys have resulted in higher response rates than comparable telephone surveys, are not susceptible to coverage loss due to the increasing penetration of cell-only households, and are capable of generating preliminary estimates in a timeframe comparable to that of telephone surveys (Andrews et al. 2010, Brick et al. 2011).

While the benefits of dual-frame surveys have been well documented, a recurring limitation of the design is an inability to match the component sample frames with certainty. Inaccurate matching results in inaccurate sample weighting, which subsequently has the potential to introduce bias into the dual-frame estimates. Frame matching is further complicated by the differing units of the sample frames; the units on the ABS frame are households and the units on the license frames are individual anglers. This complicates estimation and requires assumptions about the license possession of individual residents within households that match to the license frame.

A forthcoming report from the effort survey design team describes in detail the results of the completed pilot studies, including the benefits and limitations of the dual-frame design. Specifically, the report, 1) summarizes the various fishing effort survey design alternatives developed through MRIP, 2) provides an overview of common sources of survey error and their potential impacts on estimates, 3) assesses observed differences in fishing effort estimates generated through the different survey design alternatives within the context of survey errors, and 4) suggests an additional design alternative for consideration by MRIP leadership that may better address potential sources of error identified in the assessment.

## 1.2. Project Description

We propose to address the complications of the dual-frame design by testing the design recommended by the design team; a single-frame, stratified alternative to the dual-frame approach

that changes how the license frames are utilized. In the dual-frame design, the license and residential address frames are independently sampled, and the ABS sample is matched to the license frame by address to identify addresses with licensed anglers. Sample units from each frame are then contacted to collect the desired information about fishing activity, and the sample weights are adjusted to account for the overlap between the two frames. As described above, accurate matching is necessary to ensure that sample weights are adjusted appropriately and resulting estimates are unbiased.

Rather than using the license databases directly for sampling, we propose to use them to supplement and subsequently stratify ABS samples. Specifically, we will select ABS samples from residential address frames, match the samples to state license databases by address and telephone number, and survey matched and unmatched strata at different rates (e.g. we will sub-sample unmatched households) to maximize efficiency while maintaining coverage. Supplementing ABS samples with license information will allow us to retain the efficiency of sampling from the license frame while avoiding some of the potential biases and complexities associated with the dual-frame sampling and estimation designs.

Because the matching is only used to determine the sampling rate, this design is not susceptible to bias resulting from matching errors. In addition, the stratification approach provides some sampling flexibility that is lacking in the current dual-frame design. Specifically, state license frames that are out-of-date are less problematic in this design than in the current dual-frame method. Assuming that address frames are complete, an out-of-date license frame affects only the variance of the estimates because newly licensed households, which would be absent from out-of-date license frames, are included in the non-matched strata and subsequently sampled at a lower rate than would be desired. Conversely, some households with no licensed anglers would be included in the matched strata and sampled at a higher rate than desired because a previous occupant was licensed. In both cases, the sample units are assigned weights consistent with their sampling status so that the resulting estimates are unbiased. Loss in precision resulting from out-of-date license frames can be compensated for by increasing the overall sample size, although this is accompanied by an increase in survey cost. With the current dual frame approach, the date of the license is a source of matching error that may result in biases. This design feature would be of particular benefit in states with insufficient resources to update license databases more often than annually.

The ongoing, mixed-mode pilot study will continue to test the utility of address-based sampling and will also assess the impact of data collection mode on survey measurement, response, and coverage, which will help explain any observed differences in estimates between telephone and mail survey designs. We will also incorporate beneficial design features from the mixed-mode study into the proposed study as warranted. In order to provide a sufficient time-series to assess differences in estimates between the CHTS and the single-frame, stratified design, we propose to conduct the pilot study in parallel with the CHTS for a minimum of one full year.

### 1.3. Objectives

1. Test the feasibility of a single-frame, stratified sampling design for collecting recreational fishing effort data and estimating fishing effort by mode.
2. Based upon the results of the study, finalize the design for the new MRIP fishing effort survey to replace the CHTS.

### 1.4. References

Andrews, W.R, Brick, J. M., Mathiowetz, N., and Stokes, L. (2010). Pilot test of a dual frame two-phase mail survey of anglers in North Carolina. Final Report for National Oceanic and Atmospheric Administration. Brick, J. M., Andrews, W.R., Brick, P.D., Edwards, W.S., King, H., Mathiowetz, N., and Stokes, L. (2011). Evaluation of Methods to Increase Response for an Angler Survey In Two States, presentation at Annual Meeting for the American Fisheries Society in Seattle, Washington.

# 2. Methodology

### 2.1. Methodology

The ABS sample frame will include all residential addresses serviced by the United States Postal Service within the study area. The ABS survey will utilize a stratified design with strata defined by geographic proximity to the coast. In addition, sampled addresses will be matched by address and/or telephone number to state saltwater license databases to define matched and unmatched sub-strata. To maximize efficiency all addresses within the matched strata and a random sub-sample of addresses within the unmatched strata will be retained in the sample.

Each address retained in the sample will be mailed a questionnaire designed to collect basic household-level information, as well as angler-level information for each household resident who fished during the reference period. Survey procedures will build upon the results of previous MRIP pilot studies and include multiple mailings of survey questionnaires, as well as reminder contacts, either by postcard or interactive voice response (IVR) telephone contacts.

As a matter of efficiency, ABS sampling will be limited to the states within the study area, and information collected from the sample will be used to estimate total fishing effort by state and mode for resident (within state) anglers. To account for fishing within the study area by nonresident anglers, we propose to sample directly from the state license databases. Data collection procedures for sampled nonresident anglers will be identical to the ABS procedures and will include multiple mailings and reminder contacts.

### 2.2. Regions

### 2.3. Geographic Coverage

MA, NY, NC, FL

### 2.4. Temporal Coverage

Wave 5, 2012 - Wave 6, 2013

### 2.5. Frequency

Bi-Monthly

### 2.6. Unit of Analysis

Angler Trip

### 2.7. Collection Mode

Mail (with possibility of telephone data collection)

# 3. Communications Plan

### 3.1. Internal

The project team will communicate via email and conference calls on an as-needed basis.

### 3.2. External

Monthly reports will be submitted via MDMS as required by the MRIP Operations Team.  In addition, a preliminary project report will describe project results from the first two waves a data collection, and a final report will be submitted at the conclusion of the project.

# 4. Assumptions and Constraints

### 4.1. New Data

Yes

### 4.2. Track Costs

### 4.3. Funding Vehicle

NMFS (ST1) Contract

### 4.4. Data Resources

State saltwater license databases for MA, NY, NC and FL for each wave.

### 4.5. Other Resources

### 4.6. Regulations

### 4.7. Other

# 5. Risk

## 5.1. Project Risk

Table 1: Project Risk

| Risk Description | Risk Impact | Risk Probability | Risk Mitigation Approach |
|---|---|---|---|

# 6. Final Deliverables

### 6.1. Additional Reports

A preliminary report after two waves of data collection

### 6.2. New Data Sets

Effort Survey Datasets

### 6.3. New Systems

# 7. Project Leadership

### 7.1. Project Leader and Members

Table 2: Project Members

| Project Role | Name | Organization | Title |
|---|---|---|---|

# 8. Project Estimates

### 8.1. Project Schedule

Table 3: Project Schedule - Major Tasks and Milestones

| # | Schedule Description | Planned Start | Planned Finish | Prerequisites | Milestones |
|---|---|---|---|---|---|

### 8.2. Cost Estimates

Table 4: Cost Estimates

| Project Need | Cost Description | Date Needed | Estimated Cost |
|---|---|---|---|
| TOTAL | | | $0.00 |